



## **World Robot Olympiad 2018**

WeDo Open Category  
(Age up to 10 years)

Game Description, Rules and Evaluation

# **FOOD MATTERS**

## **AUTOMATED FOOD PRODUCTION**

Version: January 15<sup>th</sup>

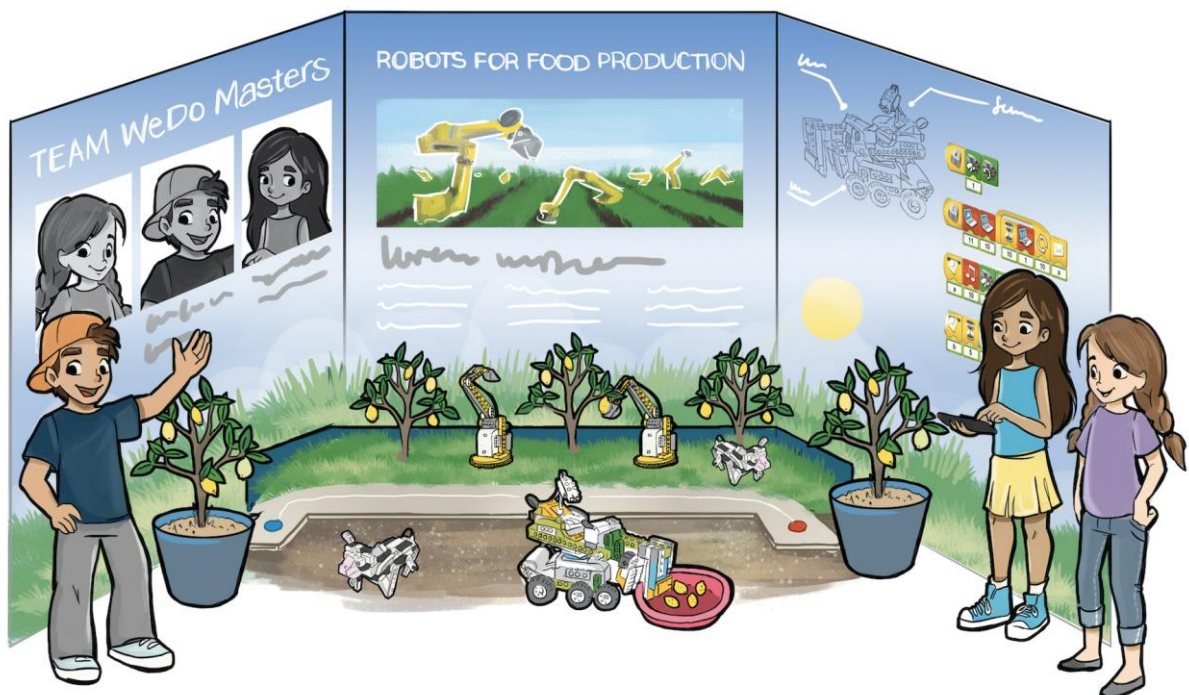


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## Introduction

Nearly 800 million people worldwide suffer from hunger. One way to decrease hunger is to grow more food. This year, the challenge is to make an exhibition that illustrates, explains and demonstrate how automated machinery and robots can help to grow more food.





## 1. Challenge Description

The WeDo Open Challenge is for each team to use WeDo 1.0/2.0 elements to construct automated machinery and robots the team can use to illustrate, explain and demonstrate how automated machinery and robots can help humans grow more food. The constructed automated machinery and robots must be placed in an exhibition booth and the team must be ready to demonstrate it for visitors and judges.

## 2. Challenge Tasks

Each team must complete a series of challenge tasks in the process of making an exhibition. Each task in the sequence must be documented with pictures/video/text displayed in the exhibition.

### Task 1 - Find Inspirational Machinery/Robots:

Find several inspirational pictures of machinery/robots that may be used to help increase food growth. The pictures might show machinery/robots that are in use today, like:





The inspirational pictures may also show machinery/robots that might be useful in the future, like:



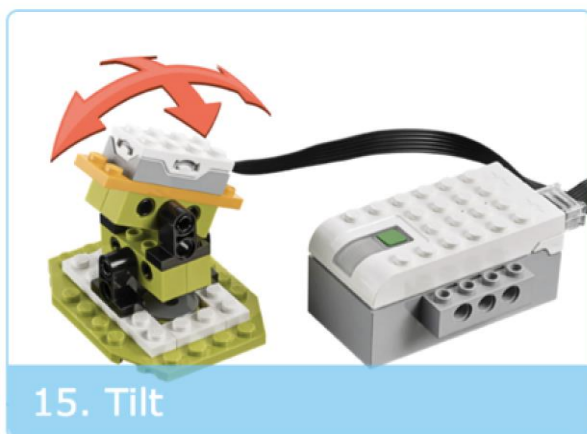
So, task1 for the team is that they find inspirational pictures for their exhibition.

## Task 2 - Explain Inspirational Machinery/Robots:

Choose at least four different machinery/robots from the found inspirational pictures and figure out how the machinery/robots work and how they may help increase food growth.

## Task 3 - Construct Machinery/Robots:

Construct machinery/robots inspired by one or more of the found inspirational pictures. Record the discussions the team had while choosing the machinery/robots to be constructed. The machinery/robots must be constructed from the WeDo 1.0/2.0 sets and any LEGO branded non-electrical/non-digital elements. In the process of choosing the machinery/robots to be constructed the team might find it useful to look in the Model Library of the WeDo 2.0 software for building inspiration:



The Program Library of the WeDo 2.0 software may be used for programming inspiration. Remember to record the sources of inspiration the team have used e.g. the Model Library, the Program Library or any other source, e.g. You Tube videos.

## **Task 4 - Construct An Environment for Machinery/Robots:**

As part of the exhibition construct an environment for the machinery/robots to operate in. The environment may be constructed out of any material to represent plants, crops, trees, fields, houses and storage buildings, etc. There should be elements in the environment that the team can use to demonstrate the workings of the machinery/robots.

## **3. Challenge Rules**

Each team has two or three team members and a team coach. The age of the team members is up to 10 years old.

### **1. Material**

- 1.1. The size of the exhibition booth provided to teams will be 2m × 2m × 2m. (Each team will be provided with three (3) vertical display surfaces within the booth, each 2m × 2m or as close as possible).
- 1.2. All elements of a team's display must remain within the allotted 2m × 2m × 2m booth area. Team members may be outside this space during a presentation, however, unless requested by judges, machinery/robots and other display elements must remain within the allotted area.
- 1.3. Teams will be provided with the option of using a table. The size of table will be 120cm × 60cm (or as close as possible). Table sizes will be consistent across teams. Tables must be placed within the 2m × 2m floor space allocated to the team. Teams will be allocated four (4) chairs in their booth area.

### **2. Regulations about the exhibition**

- 2.1. There is no restriction on the balance between LEGO elements and other materials used in the exhibition.
- 2.2. The controllers, motors and sensors used to assemble the machinery/robots must be from the LEGO Education WeDo 1.0/2.0 Core Sets. Any number and combination of controllers, motors and sensors are allowed. Any LEGO branded non-electrical/non-digital elements can be used in the construction of the machinery/robot and the environment.
- 2.3. The machinery/robot can be controlled by any compatible device using the WeDo 1.0/2.0 software or with a remote controller built from WeDo 1.0/2.0 elements and controlled with WeDo 1.0/2.0 software.
- 2.4. Machinery/robots may be preassembled and software programs may be pre-made.
- 2.5. Teams must decorate the booth with one or more posters. The poster(s)



must include the team name, introduce the team members, display the machinery/robots found and explained, document the choice of machinery/robots constructed e.g. with sketches/pictures of building process and programming attempts.

### **3. Presentation**

- 3.1. All team displays must be completed and teams ready to present to judges and the general public by the allotted time (Schedule and deadlines will be provided by the National Organizer).
- 3.2. Teams must maintain a presence within the team's booth during competition hours in order to present to members of the general public and judges at any time. Teams will receive a warning of not less than 10 minutes prior to evaluation taking place.
- 3.3. Teams will be allocated approximately 10 minutes for evaluation: 5 minutes to explain and demonstrate the machinery/robots, remaining 5 minutes to respond to questions from the judges.
- 3.4. Official language for all presentations is the native language of the team members. Interpreters are allowed if judges do not speak the native language of the team members.
- 3.5. The National Organizers decide how the achievement by the exhibiting teams could be prized e.g. with a diploma for each teams or with special awards for some teams based on criteria given by National Organizers.

## 4. Challenge Evaluation

Each team must prepare a 5-minutes presentation in front of judges. The presentation must include how the team has worked with the challenge tasks:

- Tell how the team found inspirational pictures of machinery/robots.
- Explain how some of the machinery/robots works.
- Describe how they have chosen the machinery/robots for construction.
- Demonstrate the machinery/robots in the environment of the exhibition and explain the mechanics/programs.

After the presentation each team must be prepared to participate in a 5-minute dialog with the judges, answering questions from judges in relation to their presentation, but also questions such as:

- How do the constructed machinery/robots increase food growth?
- Is there existing machinery/robots in food production similar to the machinery/robots modelled in the exhibition?
- Can the constructed machinery/robots be useful in other environments than the one shown in the exhibition?
- What part of the team's results is the team most proud of?
- If the team had more time to work on the exhibition, which part of the exhibition would the team try to improve and how could the improvement be made?

For the team the overall purpose of the evaluation is to demonstrate that they understand what they have been doing. For the judges the purpose is to help the team reflect on their process and product and through their questions provide feedback to the team on the strong and weak points in their process and product.